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moved from California who are not acquainted with the changing conditions; while so diversified is the wild life in different parts of this great state that local ornithological reports such as this are perhaps equally welcome to the resident bird students.

Mr. Tyler does not attempt a summary of previously published papers dealing with the birds of the Fresno region, but presents simply the results of his personal experience of more than ten years, with quotations from friends upon whose observations he can place reliance. One hundred and sixty-one species are included, while fifty others previously reported as occurring were omitted because the records could not be satisfactorily proven. The paper is far from the all too frequent dry, annotated list. Besides a statement on the relative abundance and the general character of occurrence of each species, there are extended observations on their habits, food and nests which make entertaining reading and form a valuable contribution to the life histories of California birds.

It is sad to read of the rapid decrease in the water birds that formerly thronged the valley and unfortunately the immediate cause is one that neither the Audubon Societies nor legislation can check. "The large grain and stock ranches" says the author, "are being subdivided, reclamation work is steadily reducing the swamp-covered areas, vineyards and orchards are springing up everywhere with a consequent great increase in population. Even the tule ponds that remain are often unsuitable for a nesting place on account of the custom of using them as foraging grounds for bands of hogs." A careful perusal of Mr. Tyler's interesting pages however shows that there is still an abundance of bird-life to interest the ornithologist in the vicinity of Fresno and with the energetic campaign now being waged on behalf of the wild life of California let us hope that some of the species now most seriously threatened may still be preserved.— W. S.

Grinnell and Swarth on the Birds and Mammals of the San Jacinto Area of Southern California.¹— This important report is based mainly upon field work conducted by the Museum of Vertebrate Zoölogy of the University of California in the year 1908, which resulted in the accession of 1099 mammals, 1533 birds and 437 reptiles. The authors describe in detail the various localities where collections were made, and discuss the life zones and faunas; annotated lists of 169 birds and 63 mammals are then presented while the paper ends with considerations of, (1) the "Boreal Fauna of San Jacinto Peak compared with that of Other Mountains of Southern California;" and (2) the "Sonoran Biota of the San Diegan District Compared with that of the Adjacent Desert."

¹ An Account of the Birds and Mammals of the San Jacinto Area of Southern California, with Remarks upon the Behavior of Geographic Races on the Margins of their Habitats. By J. Grinnell and H. S. Swarth. University of California, Publications in Zoology, Vol. 10, No. 10, pp. 197-406, pls. 6-10, 3 text figs. Oct. 31, 1913.

In considering questions of distribution the authors do not limit themselves to a consideration of life zones but recognize "three entirely different orders of ecological delimitation," which they indicate by the terms 'zonal,' 'faunal' and 'associational.' In their discussion of the zones they fail to detect in the animal life any trace of either the Hudsonian or Arctic Alpine which had been credited to the San Jacintos by H. M. Hall in his report on the flora of the mountains, and rather question the desirability of including these zones on the very meagre data that he was able to furnish. The authors state that they would use the word 'fauna' for "a subdivision of a life zone, based upon conditions of atmospheric humidity." As has been the experience of others however they find that practically it is better to use the term in a different sense, giving it in a manner a higher rank than the 'zone.' For instance they recognize a Colorado Desert and a San Diegan fauna each covering both the Upper and Lower Sonoran Zones. The late Dr. Arthur Erwin Brown advocated precisely the same plan in discussing the distribution of reptiles in Texas, and claimed that the Upper and Lower Sonoran zones of the eastern humid area had far more in common than either had with the corresponding zone in the arid region, and he therefore made his primary divisions east and west instead of zonal. Dr. J. A. Allen adopted a similar plan in his paper on 'Distribution of North American Birds' (*Auk*, X, pp. 97-150).

In their use of 'Associations' the authors are recognizing the work of the ecologic botanists, and they are essentially bringing out the correlation of the distribution of certain animals to certain plant 'formations' — an important point and one which underlay a recent paper by Dr. Spencer Trotter.¹

In their closing chapters the interesting fact is emphasized in connection with boreal islands or mountain tops that "the smaller the disconnected area of a given zone, the fewer the types which are present thereon," while the disturbing part that this principle is likely to play in attempts to establish centers of distribution and lines of dispersal upon the number of existing species is pointed out. The difference in the faunas on the two slopes of the San Jacinto mountains — semihumid on the west and extremely arid on the east, is pointed out as well as the variability in the extent to which characteristic forms of one fauna invade the other, the line of delimitation being by no means uniform for all species. This discussion opens up very interesting lines of investigation as to the reason for the different behavior of different species on the margins of their habitats and the whole paper is an excellent illustration of what may be accomplished in the study of distribution in limited areas with diversified physical conditions, such as prevail so frequently in the west but are hard to find in the eastern states.

The annotated list of birds is a valuable one and contains much impor-

¹ cf. *Auk*, 1913, p. 450.

tant original information on the habits, abundance, and relationship of the species treated. While gross comparisons are hardly permissible it is nevertheless interesting to note that of the 146 species and subspecies of land birds 85 are identical with those listed in Mr. Tyler's *Birds of Fresno* noticed above.—W. S.

Gifford's 'Birds of the Galapagos Islands.'¹—At the time of the earthquake and conflagration at San Francisco the Academy of Sciences had an expedition in the Galapagos which during an absence of 17 months secured the finest series of collections yet obtained on these interesting islands, and these have formed the nucleus of the new museum which the Academy has had to build up. Reports on several of the collections have already been published and in the contribution before us Mr. Edward W. Gifford, assistant curator of ornithology at the Academy, and ornithologist of the expedition, presents the first installment of an account of the ornithological material that was obtained, of which the skins alone number 8,691.

Forty-five species are treated in the present installment all of which, except the Dove, are water birds. The fullness of the accounts of the resident species leaves little to be desired and the completed report promises to be the most important contribution to the ornithology of the Galapagos that has yet appeared. Seven half-tones illustrate some of the more interesting species and their nests, including photographs of the flightless Cormorant (*Nannopterum harrisi*).

The nomenclature and sequence follow Sharpe's 'Hand List,' but even with this fact clearly stated it is unfortunate that the authorities for the names were not added, as is customary in all works of such importance as the present. We trust that Mr. Gifford may be able to push his report to an early completion and maintain the high standard that he has established.—W. S.

Brooks' List of the Birds of West Virginia.²—Mr. Viquesney's report as forest, game and fish warden of West Virginia is another of the admirable, educational reports that are being issued today by game wardens in various states.

In addition to general information on the protection of insectivorous and game birds, there is included a carefully prepared list of all the birds of the state by Rev. Earl A. Brooks. This is divided into two parts, one

¹ Expedition of the California Academy of Sciences to the Galapagos Islands 1905-1906. VIII. The Birds of the Galapagos Islands, with Observations on the Birds of Cocos and Clipperton Islands (Columbiformes to Pelecaniformes). By Edward Winslow Gifford. Proc. Cal. Acad. Sci. Fourth Series, Vol. II, Pt. I. pp. 1-132, pl. 1-7. August 11, 1913.

² Second Biennial Report of the Forest, Game and Fish Warden [of West Virginia] 1911-1912. J. A. Viquesney. Bellington [W. Va.] [1913]. 8vo. pp. 1-106 with 19 half-tone plates. List of birds, pp. 87-106.